Sitras SMS

Stray current monitoring system for DC traction power supply

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The Sitras® SMS stray current monitoring system is used to monitor the track potential of DC railway networks.

This system permits evaluation of the stray current conditions of the track and the early detection of insulation deficiencies, thus enabling measures to be taken to prevent damage due to stray current corrosion.

Features

- Continuous monitoring of track potentials during operation
- Automatic location of insulation deficiencies
- Representation, archiving and analysis of track potentials in a central evaluation unit
- Transmission of measured values via the communication network, existing networks can be used
- No interference with stray current conditions because Sitras SMS is based on potential measurement

Design

Main components

The Sitras SMS stray current monitoring system consists of the following main components:

- Measuring sensors along the track (located about every 1 to 3 km)
- Communication network
- Central evaluation unit (PC with communication interface and Simatic WinCC® software), such as located in the operations control centre

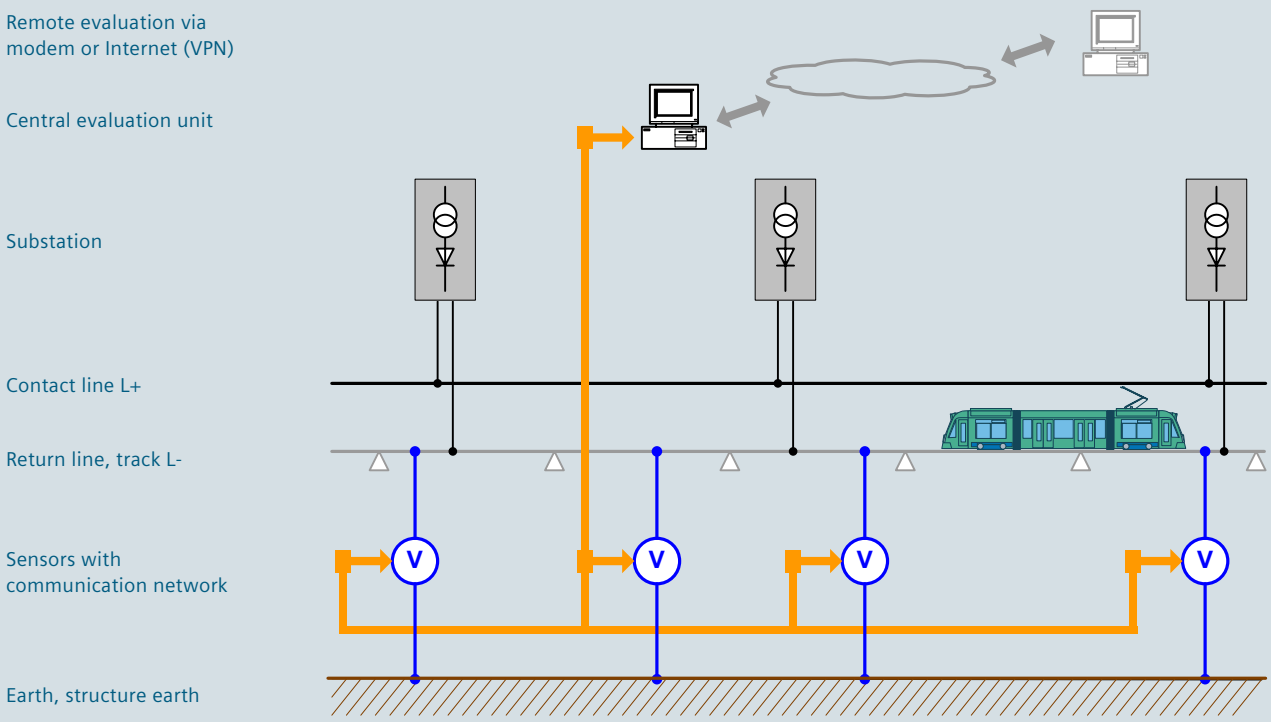
Measured value acquisition

Sitras SMS collects information about the voltages between return line L- and earth (structure earth) at several measuring points along the tracks to be monitored during railway operations. The measured values are represented and evaluated in order to locate any insulation deficiencies.

Communication

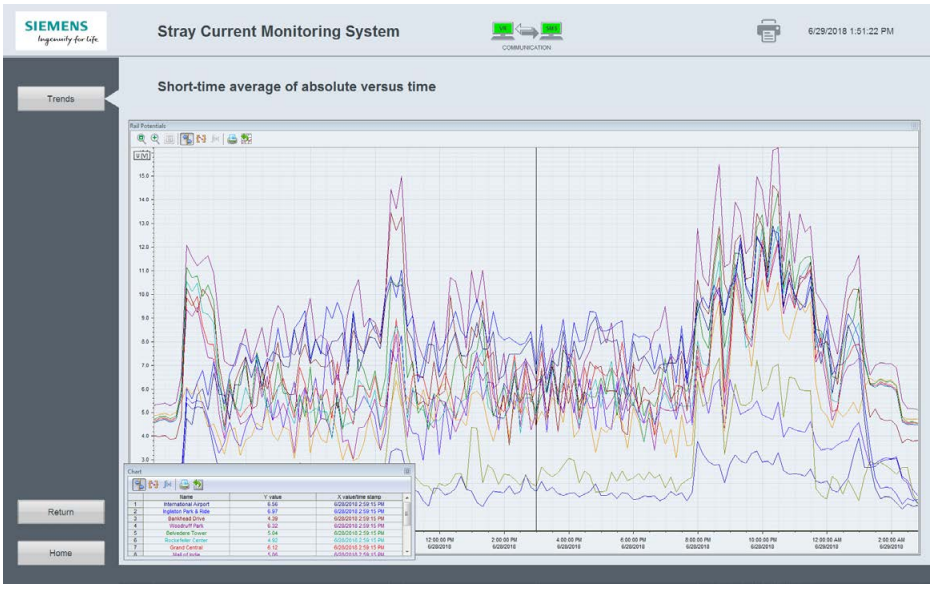
The measured values are transmitted from the sensors to the central evaluation unit via a communication network, by SCADA for example. Existing networks can be used.

Basic Design

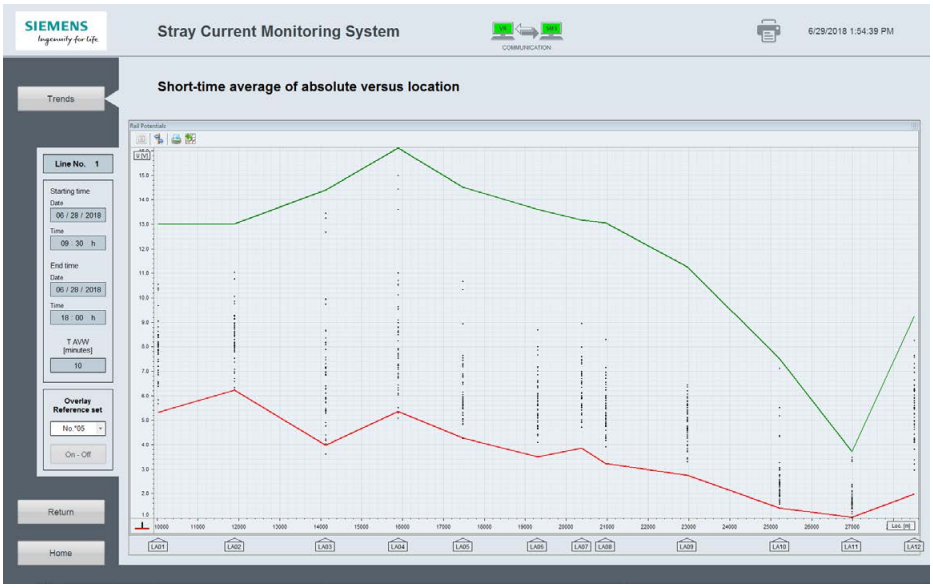


Sitras SMS basic design

Function



Representation of average values as a time characteristic



Representation of average values along the line

The central evaluation unit with the basic software Simatic WinCC performs the following functions:

- **Data acquisition**
- **Archiving** with multi-level data compression:
  - Representation of the track potentials at all measuring points
  - Instantaneous values as a time characteristic
  - Average values and averages of the absolute value as short-term and long-term averages
  - Representation of average values as a time characteristic or at a line location
- **Location** of insulation deficiencies:
  - Reference value recording
  - Automatic analysis

To locate insulation deficiencies, Sitras SMS compares the current measured values with previously recorded reference values (“fingerprint”). If the track potentials exceed the tolerance range with respect to certain criteria, a message will be generated. The location of the suspected insulation deficiencies can be pinpointed by means of integrated analysis functions.

Technical data

Data aquisition	
Via communication network and Simatic® NET® interface module	
Maximum number of measuring points	60
Maximum number of lines	5
Communication interface	Ethernet TCP/IP (e.g. Simatic S7, ProfiNet, OPC UA)

Representation and archiving	
Instantaneous values	time characteristic
Archiving of instantaneous values	last 52 weeks
Short-term values:	
Averages of the absolute value	time characteristic
Averages of the absolute value line	characteristic along the line
Width of average value window	1…60 minutes
Archiving of average values / averages of the absolute value	min. 10 years**
Long-term values:	
Averages of the absolute value	time characteristic
Averages of the absolute value line	characteristic along the line
Width of average value window	1…7 days
Archiving of average values / averages of the absolute value	min. 10 years**
Dialog languages	German / English / Spanish / Turkey*

Analysis of rail potentials (localization of insulation deficiencies)	
Reference value and automatic analysis	during operation
Width of average value window	2…60 minutes
Daily recording period	parameterizable
Maximum number of reference value records	10

* other values on request
** depending on size of hard disk

References

Since market introduction in 2002, our system solutions are in use worldwide, e.g.

- TriMet Portland, USA
- VAG Nuremberg, Germany
- BTS Sukhumvit Ext., Thailand

Security information

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

For more information about industrial security, please visit: http://www.siemens.com/industrialsecurity.

Sitras SMS / Product information
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